MIMAP Bangladesh

Micro Impacts of Macroeconomic and Adjustment Policies in Bangladesh

Technical Paper No. 02

Poverty Implications of Trade Liberalization in Bangladesh: A General Equilibrium Approach

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Poverty Implications of Trade Liberalization in Bangladesh: A General Equilibrium Approach

1. Introduction

The process of globalization involves greater participation of individual countries in world trade, foreign direct investment and the capital market. Over the last few decades, reduction of natural barriers such as transportation and communication costs and revolution in information technologies and removal of artificial impediments like tariff and non-tariff barriers have fostered greater interdependence among the countries of the world through increased trade and private capital flows. During the period, a growing number of developing countries have also adopted outward-oriented liberalization measures in the hope that greater global integration of their economies will lead to faster poverty reduction through accelerating economic and productivity growth and thereby supporting the consumption gains of the people. The contribution of globalization to growth and poverty reduction, however, varied considerably across the countries. At the same time, concerns have been expressed regarding the potential long-term negative effects of globalization which may outweigh the positive impacts of economic integration. Moreover, the consensus seems to suggest that the effects of globalization are likely to be country-specific and should be examined keeping the country context in view.

In Bangladesh, one of the significant features of globalization has been the introduction of measures to bring liberalization and openness in the economy. Since the 1980s, the Government undertook reform programmes to accelerate growth through wide-ranging policies to improve competitiveness, enhance economic efficiency, and dismantle state interventions to create conditions for promoting export-led growth. As a part of the process, significant reforms have been implemented in trade regime by liberalizing external trade and foreign exchange regulations and introducing deregulatory measures to facilitate increased participation of the private sector. Both tariff and non-tariff barriers have been reduced along with dismantling of quantitative restrictions on imports and deregulation of import procedures. More specifically, the measures to rationalize the tariff structure involved reduction in average tariff rates and the number of duty slabs, lowering the gap between the statutory nominal protection and the observed levels, narrowing down the tariff dispersion

and minimizing the control list of banned and restricted items.[1] The extent of liberalization is reflected in the fact that the mean tariff rate for all products declined to 22 per cent in 1999 from 114 per cent in 1989. Moreover, the decline was sharp for Bangladesh compared to other South Asian countries.[2]

While these reforms have significantly changed the policy environment in the country, a proper assessment of the impact of these changes, particularly their distributional consequences, requires a comprehensive framework capable of analyzing the interactions between different sectors along with linkages between macro-policies and various household groups. In particular, the liberalization policies raise several issues relating to poverty in Bangladesh: How does trade liberalization affect the welfare status of different socioeconomic groups especially the poor? Are countervailing policies needed to make such policies more equitable? Evidently, the issues are complex and limited availability of empirical evidence on the nature of impact of these policy changes makes it difficult to draw specific policy conclusions. Moreover, the poverty linkages, to a large extent, depend on propagation channels through which the impacts of trade liberalization are transmitted to different economic sectors and socioeconomic groups.

The present study seeks to assess the characteristics of the transmission channels of trade liberalization policies in Bangladesh and examine their poverty implications. Although significant interactions exist among different reform measures in practice, the study concentrates on trade reforms alone along with welfare implications of these reforms in terms of impact on absolute and relative poverty. The aim of the analysis is to contribute to better understanding of the relationships between trade reforms and poverty in Bangladesh, a least developed country, and help identify policy options that are capable of promoting liberalization in a more equitable manner.

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[1] As a result, the Bangladesh economy has become more open in the 1990s compared to any period in the past. Several indicators highlight the extent of trade liberalization achieved in the 1990s. The highest rate of customs duty was reduced from 350 per cent in 1991/92 to 37.5 per cent in 1999/00. Similarly, four slabs of duty rates were introduced in 1999/00 in place of 24 in the 1980s and the number of items banned and/or restricted due to trade or non-trade reasons at the 4-digit Harmonized System (HS) code level declined from 315 in 1989/90 to 124 in 1997-2002.

[2] In India, for instance, the mean tariff for all products declined to 33 per cent in 1999 from 82 per cent in 1990 and, in Sri Lanka, the decline was from 28 per cent in 1990 to 20 per cent in 1997. See World Bank 2000.

2. The Bangladesh Economy and Trade Policies: Main Features and Changes

The Bangladesh economy has undergone significant sectoral changes since the 1980s (Table 1). The share of agriculture in GDP has declined to around a quarter by 2000 while nearly a half of the GDP comes from the service sector.[3] The average rate of GDP growth has been 4.3 per cent per year since the 1980s although the economy has shown a better growth performance in the 1990s. The growth in per capita GDP also accelerated during the 1990s both due to increased economic growth and reduction in the rate of population growth.

Table 1: Structure and Growth of the Bangladesh Economy

A. Structure

	Share (per cent) in GDP at constant 1995/96 prices			
	1980	1990	1995	2000
Agriculture	33.2	29.5	26.0	25.6
Industry	17.1	20.8	24.3	25.7
Services	49.7	49.7	49.7	48.7
Total	100	100	100	100

B. Growth

	Per cent at constant 1995/96 prices			
	1981-2000	1981-1990	1991-1995	1995-2000
Agriculture	2.8	2.3	1.6	4.9
Industry	6.4	5.8	7.5	6.4
Services	4.8	3.7	4.1	4.8
GDP	4.3	3.8	4.4	5.2
Per capita GDP	2.3	1.6	2.4	3.6

Source: BBS 2000, 2001.

Since independence in 1971, three major phases of evolution in trade policies may be identified in Bangladesh. The period covering 1972 to 1978 was characterized by the pursuit of an import-substitution strategy through quantitative restrictions on imports, import licensing and strict exchange control measures. The distorted incentive structure of the period, however, led to allocative and productive inefficiencies, strained the external sector, created anti-export bias, and consequently resulted in low growth of the economy. This prompted the policy makers to introduce reforms towards a free market economy and export-

[3] Despite the declining relative share of agriculture in GDP, agriculture continues to remain the major sector in terms of employment with about 62 per cent of total employed persons in 2000.

led industrialization although at a relatively slow rate over the 1979-1990 period.[4] The third phase (1990-2000) was characterized by greater openness of the economy through accelerated trade liberalization, financial and fiscal reforms, and privatization.

The Bangladesh economy was highly protected and inward looking until the end of the 1970s. During 1978, for example, there were 36 different tariff rates ranging from zero to 400 per cent. Quantitative restrictions were also widespread. The reason for pursuing such a restrictive trade policy was two-fold: to protect domestic industries and to raise revenue. This, however, resulted in an expansion of inefficient industries and misallocation of resources with adverse consequences on the export sector and the economy. Trade reforms, launched in the 1980s, were aimed mainly at rationalizing and reducing tariffs and other import taxes, and eliminating import prohibitions and quantitative restrictions. Incentives were also introduced to boost exports and diversify the export base. In the 1990s, Bangladesh embarked on a liberal trade and investment policy. The 1991 Industrial Policy, for example, targeted the expansion of export-oriented industries and employment creation through attracting foreign investment and removing all barriers to make the industrial sector more efficient and internationally competitive.

2.1 Reduction of Import Barriers

The primary objective of reducing import barriers over the last two decades was to rationalize and simplify the trade regime through lowering the tariff rates, phasing out the quantitative restrictions, streamlining import procedures and introducing tax reforms. These reforms brought significant changes in the overall tariff structure. Several features of the changes may be summarized as follows:

(i) The number of commodities under the four-digit code subject to quantitative restrictions declined from 550 in 1987 to 124 under the Import Policy of 1997-2002. In 1991/92, about 12 per cent of around 10,000 tariff lines were subject to such restrictions which declined to less than 4 per cent in 1998/99. At present, less than 0.5 per cent of imports, mainly in the textile category, are subject to quantitative restrictions;

[4] The reform programmes of the period included different measures like fiscal, financial, trade and industrial policy reforms; public resource management and privatization; and institutional and sectoral reforms. These economy-wide reforms and structural adjustments initiated in 1986/87 formed components of the Structural Adjustment Facility (SAF) and the Enhanced Structural Adjustment Facility (ESAF) of the IMF and the World Bank. For details on evolution of these policies, see Sobhan 1991, Mujeri et. al. 1993.

(ii) Average tariff rates have been significantly reduced. The mean tariff on all products declined from 114 per cent in 1989 to 22 per cent in 1999 and the weighted mean tariff from 114 per cent to 19 per cent over the same period (Table 2);

Table 2: Import Liberalization in Bangladesh

A. Removal of Quantitative Restrictions (QRs) at 4-Digit HS Code-Level					
Year	Total QRs in place[a]	Trade reasons			Non-trade reasons
		Banned	Restricted	Mixed	
1987	550	252	151	86	61
1989	433	165	89	101	78
1990	315	135	66	52	62
1992	193	78	34	25	56
1995-1997	120	5	6	17	92
1997-2002	124	5	6	17	96

B. Changes in Tariff Barriers (Per cent)		
	1989	1999
A. All products		
Mean tariff	114.0	22.1
Standard deviation of tariff rates	84.9	14.6
Weighted mean tariff	114.2	19.0
B. Primary products		
Mean tariff	85.1	21.1
Standard deviation of tariff rates	58.7	13.1
Weighted mean tariff	76.1	21.0
C. Manufactured products		
Mean tariff	123.2	22.4
Standard deviation of tariff rates	89.8	15.0
Weighted mean tariff	125.5	18.5

[a] There are a total of 1,240 four digit tariff headings under the Harmonized System.
Source: Mujeri 2000, World Bank 1999, 2000.

(iii) The combination of maximum tariff rate reductions and a tariff decrease from 2.5 per cent to zero per cent on some products led to a narrowing down of tariff bands;

(iv) Import taxes such as development surcharges, regulatory duties and sales taxes were abolished in 1991[5]; and

(v) Various measures were introduced with a view to simplifying import procedures. In 1985/86, two lists were introduced to replace the 'positive list' (which contained all goods that could be imported into Bangladesh along with their constituent raw and

[5] Despite reduction in the tariff rates, total tariffs still remain high by international standards since, in addition to customs duty, other taxes are also levied on imports e.g. value added tax, supplementary duty, infrastructure development surcharge and license fee. Thus, although the average implicit (expost) customs duty at present is around 14 per cent, the total average expost 'tariff' is approximately 27 per cent.

packing materials): all banned items were listed under a 'negative list' and those importable under certain conditions were registered on a 'restricted list'.[6] All other products could be imported freely. Over the years, Import Policy Orders showed substantial reduction in the number of banned and restricted items.

Overall, Bangladesh's trade policies were liberalized rapidly in the 1990s. As a result, the economy has become significantly outward-oriented both due to quantitative changes in tariff and removal of non-tariff barriers.[7] It has been observed that Bangladesh's 'nominal import protection level currently ranks among the lowest in South Asia' and that 'tariff reduction in Bangladesh during the early 1990s has been one of the fastest amongst the reforming countries' (CPD 1997). The extent of protection of the domestic economy also declined due to changes in the tariff structure. The effective rate of protection (ERP) declined from 76 per cent in 1992/93 to 27 per cent in 1998/99 (Table 3). While significant liberalization has been achieved in the 1990s, the scope for further reduction, compression and rationalization of the tariff structure still exists with a view to reducing economic distortions and welfare losses resulting from the trade policy.

Table 3: Nominal and Effective Protection Rates in Bangladesh

	1992/93	1995/96	1998/99
Nominal protection rate:			
Unweighted	55.4	27.1	27.2
Weighted	28.2	22.3	20.3
Effective protection rate:	75.7	33.0	26.8

Source: Mujeri 2000.

[6] For example, out of the 391 items which were listed under the 'negative list' in 1985/86, only 24 remained in 1993/94. Similarly, the number of items on the 'restricted list' over the same period was reduced from 351 to 91.

[7] The outward-orientation or openness of an economy is, however, difficult to measure. See Pritchett 1996. While tariff and non-tariff barriers are widely used indicators, movements in the real exchange rate can have significant impact on an economy's response to trade reform. Even with tariff and non-tariff barriers, the appropriate summary measures may differ. For instance, nominal tariffs give a better indication of the distortion in consumption while effective tariffs better represent the distortion in production. Similarly, production-weighted effective protection rate may be more appropriate to measure the distortion in production and consumption-weighted nominal tariff for the consumption distortion. Moreover, these measures may not reflect the true picture since other trade policies (e.g. duty drawbacks, export processing zones, export subsidies) have been used by Bangladesh as countervailing measures for export promotion. These are discussed in the next section. Moreover, measures of non-tariff barriers usually reflect the coverage of particular restrictions but not the severity of their application.

2.2 Export Promotion Measures

Over the years, the Government attempted to promote exports through various measures. The policies for export promotion emphasized the need to diversify the export base, stimulate higher value-added exports, improve the quality of exports, develop backward linkage industries and undertake vigorous marketing efforts. Incentives are provided to the exporters in the form of special bonded warehouses, export processing zones (EPZs), duty drawback and a number of other methods.[8] Against the backdrop of phasing out of the Multi Fibre Arrangement (MFA) by 2005 and the facilities that Bangladesh will have to forgo as a LDC for the export of its textile products, the country aims at achieving self-sufficiency in fabrics to meet the requirements of the garment industry through establishing backward linkages. It is important, however, to encourage the promotion of backward linkages to the extent that they do not adversely affect export competitiveness. An important concern in export promotion in Bangladesh is to ensure enhanced coherence and consistency in export policy through adopting a uniform export strategy that allows the private sector to respond to predictable and stable market incentives.

2.3 The Exchange Rate System

In line with the overall framework of trade reforms, gradual liberalization of foreign exchange restrictions has also been implemented. The Government replaced the policy of maintaining a multiple exchange rate system by a unified exchange rate in 1992 and the domestic currency, Taka, was pegged to a currency-weighted basket. Since then, a policy of creeping devaluation has been followed to maintain exchange rate flexibility and export competitiveness within a more market-determined exchange rate regime. The Taka has been made convertible for all current account transactions along with measures to set in motion the inter-bank foreign exchange market.

2.4 Trade and Investment Flows

The trade liberalization process since the 1980s has been associated with considerable intensification of trade and investment flows. The growth and structural changes in merchandise trade can be seen in Table 4. Compared with an average annual growth of about

[8] The system of support to exporters that exists in the country is highly complex, fragmented and consists of wide range of different measures applying in specific circumstances. Several measures may be noted e.g. rebate on insurance premiums, income tax rebate, export credit guarantees, incentives for export of non-traditional industrial products, export promotion fund, retaining foreign exchange from export earnings, VAT refunds, tax holiday and other incentives.

Table 4: Growth and Structural Changes in Bangladesh's Merchandise Trade

A. Growth		Average annual % growth	
		1980-1990	1990-1997
Export:	Volume	7.6	12.9
	Value	7.6	13.2
Import:	Volume	1.8	9.1
	Value	3.7	11.8

B. Structural Change	Merchandise exports		Merchandise imports	
	1980	1998	1980	1998
Total value (US$ million)	793	5,141	2,353	6,862
	% of total			
Food	12	7	24	15
Agricultural raw materials	19	2	6	5
Fuels	0	0	9	7
Ores and metals	0	0	3	2
Manufactures	68	91	58	69

Source: World Bank 2000.

8 per cent in the 1980s, merchandise exports in both volume and value terms increased by around 13 per cent per year in the 1990s. In the case of imports, the rates increased substantially to around 9 per cent for volume and 12 per cent for value in the 1990s compared with less than 2 per cent and 4 per cent for volume and value respectively in the 1980s. The export trade basket, moreover, indicates an increasing concentration of a broad category of manufactured goods consisting of an assortment of simple manufactured goods like readymade garments, leather and leather products, fabrics, and made-up articles which accounted for 91 per cent of total merchandise exports in 1998. This shows that Bangladesh's exports have increased through exporting more of the same or similar goods and, from this perspective, have displayed little dynamism. Nevertheless, the 'openness ratio', as measured by trade to GDP ratio, has increased. The share of foreign trade (merchandise exports and imports) in GDP increased from 19 per cent in 1984/85 to nearly 35 per cent in 2000/01 (Table 5). The ratio, however, is still low in relation to the ratio observed for all developing countries (43 per cent in 1990-94). Similarly, the pace of integration has been slow at 0.6 per cent per year which, although better than the average of South Asian countries, is lower than the average of all developing countries (0.7 per cent).[9]

[9] Two alternative measures, trade in goods as a share of PPP GDP and goods GDP, also indicate increased global integration of the Bangladesh economy in the 1990s. The trade in goods as a share of PPP GDP increased to 7.0 per cent in 1998 from 4.2 per cent in 1988. Similarly, the share of trade in goods GDP increased to 56.1 per cent from 29.9 per cent over the same period. The dynamism of the trade regime, as measured by the difference in growth in real trade and growth in real GDP, was also high at 7.2 per cent during the period. See Mujeri 2002.

Table 5: Openness Ratio of the Bangladesh Economy

	1984/85	1989/90	1994/95	2000/01
	As per cent of GDP			
Imports	13.2	13.5	17.4	20.1
Exports	5.6	6.1	10.9	14.6
Total trade	18.8	19.6	28.3	34.7
Openness ratio	***18.8***	***19.6***	***28.3***	***34.7***
	Nominal level (per cent)			**Annual average**
	1975-79	**1990-94**		**change (per cent)**
Regions				
Developing countries	31.8	42.8		0.7
East Asia	31.2	54.6		1.6
South Asia	17.6	25.1		0.5
Bangladesh	***19.1***	***28.0***		***0.6***

Source: BBS 2000, 2001 and World Bank 1997.

The level and pace at which foreign direct investment (FDI) increases are important indicators of the global financial integration of a country. Bangladesh's exposure to natural disasters and a high propensity to import, among other factors, have persistently contributed to chronic current account deficits in the country. A key policy issue has, therefore, been to find ways to meet the structural deficits of the current account balance. In this respect, measures of attracting FDI have proved to be largely unsuccessful. Despite its comparative advantage in terms of low labour costs, FDI in Bangladesh reached only US $ 125 million in 1995/96 growing from an average of less than US $ 10 million in the previous five years (Table 6). The FDI registered with the Board of Investment (BOI), however, indicates a rising trend which is six times higher than actual FDI flows.[10] According to actual FDI flows, FDI to GDP ratio was only 0.03 per cent in the early 1990s. The ratio is low compared with the ratios for all developing countries (1.18 per cent) and the South Asian countries (0.44 per cent). Similarly, the pace of financial integration is also slow compared with the pace observed in developing countries and other South Asian countries.

[10] The BOI approved FDI data refer to registered amount which may not be realized due to various factors. As a result, there exists considerable gap between BOI approved FDI figures and actual FDI inflows.

Table 6: Capital Flows into Bangladesh

(million US $ unless stated otherwise)

	1990	1991	1992	1993	1994	1995	1996
Total flows:	1708	1684	1440	1030	1485	906	1247
Official flows	1638	1648	1423	1023	1455	896	1203
Private flows	70	36	17	7	30	10	44
of which:							
Foreign direct investment	3	1	4	14	11	2	15
Portfolio equity investment	0	0	0	0	0	0	0
Other private flows	67	35	13	-7	19	8	29
			Per cent of GDP				
Total private flows	0.31	0.15	0.07	0.03	0.12	0.04	0.14
Foreign direct investment	0.01	0.00	0.02	0.06	0.04	0.01	0.05
Portfolio equity investment	0	0	0	0	0	0	0
Other private flows	0.30	0.15	0.05	-0.03	0.07	0.03	0.09

Memorandum Items	**Nominal level**		**Annual average change**
	1975-79 (per cent)	**1990-94 (per cent)**	**(per cent)**
Developing countries	0.84	1.18	0.02
East Asia	0.87	2.69	0.12
South Asia	0.10	0.44	0.02
Bangladesh	0.00	0.03	0.00

Note: Other private flows consist of flows from commercial banks, bonds, and other private sources.

Source: World Bank 1997 and own estimates.

As a result, the country remained highly dependent on official aid flows from multilateral and bilateral donors. Between 1971 and 2001, total foreign aid disbursement to Bangladesh amounted to US $ 37.7 billion, 48 per cent of which was in the form of grants and the rest in loans. Although loans have assumed greater importance relative to grants in total aid flows in recent years, Bangladesh's debt service payment does not weigh heavily on the balance of payments. The debt-service ratio in 2001 was about 14 per cent of the country's merchandise exports representing about 2 per cent of GDP which is lower than the similar ratio in other South Asian countries (e.g. India and Pakistan) due to the concessional terms of the loans received by the country.

In recent years, Bangladesh has significantly improved its investment and regulatory environment which includes liberalization of industrial policy, abolition of performance requirements, and allowing full foreign-owned joint ventures. New sectors have been opened up for foreign investment including the telecommunications sector in 1996 (Table 7).

Nevertheless, measurable indicators of globalization such as the openness ratio, pace of integration into the global economy, and FDI to GDP ratio indicate that the extent and pace of integration of the Bangladesh economy into the global economy still remains low and the process has been relatively slow in the past. The Government's commitment is to improve the situation for which liberal trade and investment policies have been emphasized.

Table 7: Major Elements of Bangladesh's FDI Policy

Elements	Description
Entry Barrier	Closed: Defense equipment, International air transportation, Railway transportation, Security printing, Forestry and Nuclear energy.
Full Foreign Ownership Requirement	100 per cent ownership permitted with approval.
Performance Requirement	No requirement.
Transfer of Profits and Convertibility	Restricted: Provision of transfer subject to control by BOI and the Central Bank
Incentives	EPZs: Interest on foreign loan is tax exempt. Tax exemption on royalties, technical know-how, technical assistance fees and facilities for their repatriation.

Source: World Bank 1997.

3. Poverty, Labour Market and Employment

In this section, we shall focus on changes in two areas: poverty and income distribution, and the labour market. In a low-income country such as Bangladesh, the developments in the labour market are important determinants of poverty. The labour market's role in the country largely derives from its limitations in providing productive and gainful employment opportunities to the large majority of the labour force. With low skills and the limited scope of employment in the formal sector, the vast majority of the labour force subsists in low-productive informal activities with limited ability to generate decent incomes required for moving out of poverty.

3.1 Recent Trends in Poverty

The inter-temporal estimates of poverty in Bangladesh show substantial variations due to differences in underlying assumptions and methodologies.[11] Nevertheless, some trends

[11] For an analysis of the implications of different methodologies on poverty estimates, see Ravallion 1990, Ravallion and Sen 1996. The alternative poverty estimates highlight important issues of measurement of poverty, aggregation of numbers, choice of calorie norms, and other dimensions. For a review of available estimates, see Hossain and Sen 1992, Mujeri 1999.

can be discerned with the available data (Table 8). It shows that the incidence of poverty, as measured by the head-count index, declined to 50 per cent in 2000 from 59 per cent in 1983/84. Both urban and rural poverty have declined although the incidence of rural poverty remains higher than that of urban poverty. Over the entire period since the early 1980s, poverty incidence has declined at a slow rate with substantial variations over different sub-periods and between rural and urban areas. Between 1984 and 2000, rural poverty declined by only 7 percentage points. Given the fact that 80 per cent of the poor live in rural areas, total poverty incidence declined by only 9 percentage points although the decline in incidence of urban poverty has been higher. Moreover, the absolute number of the poor increased to 63 million from 56 million between 1984 and 2000 – an increase of 7 million over a period of 16 years when total population increased by about 30 million.

Table 8: Changes in Incidence of Poverty in Bangladesh

Year	Head count ratio (per cent)			Number of poor (million)		
	Rural	**Urban**	**Total**	**Rural**	**Urban**	**Total**
1983/84	59.6	50.2	58.5	50.3	5.6	55.9
1988/89	59.2	43.9	57.1	53.7	5.7	59.4
1991/92	61.2	44.9	58.8	57.5	6.4	63.9
1995/96	55.2	29.4	51.0	53.6	5.7	59.3
2000	53.0	36.6	49.8	53.5	9.2	62.7

Note: The figures are based on the Household Expenditure Surveys of the BBS. The poor have been estimated using the cost of basic needs (CBN) method and are taken as those living below the poverty line which corresponds to an intake of 2,122 kcal/person/day and a nonfood allowance corresponding to nonfood expenditure among household whose food expenditure equals the food poverty line. The number of the poor has been derived by the authors using estimated population and its rural-urban distribution implicit in respective surveys.

Source: World Bank 1998, BBS 2001.

If we take the period of the 1980s as the pre-trade liberalization period, variations in the rate of poverty reduction during the period and afterwards may be noted (Table 9). During the 1980s, the incidence of poverty marginally increased due to increasing rural poverty despite the decline in urban poverty at a rate of 1.4 per cent per year. In contrast, the 1990s witnessed a decline in the incidence of total poverty at an annual rate of 1.9 per cent when both rural and urban poverty declined at the rates of 1.7 per cent and 2.3 per cent per

year respectively. This shows that Bangladesh's performance in reducing absolute poverty has been better in the 1990s compared with earlier periods.

Table 9: Poverty Reduction Rates during Pre- and Post Liberalization Period

(Per cent per year)

	1984-1992	1992-2000
Rural	0.33	-1.67
Urban	-1.38	-2.31
Total	0.07	-1.91

Note: Calculated from figures in Table 6.

3.2 Changes in Inequality

The nature of impact of economic growth and other macroeconomic changes on poverty is influenced by changes in the distribution of income and consumption. The favourable impact of economic growth on income poverty is likely to be reduced if growth leads to increased income inequality. In Bangladesh, inequality increased rather sharply during the early 1990s which coincided with the period of rapid trade liberalization (Table 10). The Gini index of consumption expenditure in both rural and urban areas remained largely unchanged till 1992. A similar trend may also be noted for income distribution in

Table 10: Changes in Growth and Inequality in Bangladesh

	Poverty line (Tk/person/month)	Mean consumption (Tk/person/month)	Mean consumption/ Poverty line (%)	Gini index (%)	
				Consump-tion	Income
Urban					
1983/84	301.72	396.53	131	29.8	37.0
1988/89	453.65	695.19	153	32.6	38.1
1991/92	534.99	817.12	153	31.9	39.8
1995/96	650.45	1,372.47	211	37.5	44.4
2000	724.56	1,291.53	178	36.6	45.2
Rural					
1983/84	268.92	284.84	106	24.6	35.0
1988/89	379.08	435.39	115	26.5	36.8
1991/92	469.13	509.67	109	25.5	36.4
1995/96	541.77	661.47	122	27.5	38.4
2000	634.48	820.20	129	29.7	36.6

Source: BIDS 2001, BBS 1998, 2001.

both rural and urban areas. The urban Gini index for consumption expenditure, however, rose sharply to nearly 38 per cent in 1996 (from 32 per cent in 1992) in urban areas and marginally declined to 37 per cent in 2000. In rural areas, inequality in consumption expenditure also increased. In the case of income inequality, the trends were similar with a sharp increase in Gini index during the mid-1990s. Moreover, income inequality is much higher than consumption inequality in both rural and urban areas. One may also note that urban inequality increased more than rural inequality along with widened disparity between rural and urban areas.

3.3 Developments in the Labour Market

A significant aspect of the demographic developments in Bangladesh is the rapid growth of the labour force. The labour force grew at a much faster rate than the growth in population and the demand for labour.[12] The trends in employment since the mid-1980s can be seen in Table 11. The figures indicate that, between 1985/86 and 1995/96, total employment in the country increased by around 10 million with an employment level between 40.3 million and 54.6 million in 1995/96 depending on the alternative statistical

Table 11: Trends in Employment in Bangladesh

(in million)

	1985/86	1989	1990/91	1995/96
A. Usual definition				
Employed population	30.5	32.7	34.9	40.3
Male	27.4	29.4	30.4	33.2
Female	3.1	3.3	4.5	7.1
B. Extended definition				
Employed population	...	50.1	50.2	54.6
Male	...	29.4	30.5	33.8
Female	...	20.7	19.7	20.8

Note: The usual definition refers to any person aged 10 and over employed (worked at least one hour in a week) with/without pay or profit during the reference period excluding own household economic activities. The extended definition uses a similar concept but includes some household economic activities e.g. care of poultry and livestock; threshing, boiling, drying, processing and preservation of food, and similar other activities.

Source: BBS 1998.

[12] During 1961 to 1991, total population of the country increased from 50.8 million to 111.5 million (that is, by nearly 120 per cent) while the labour force grew from 16.9 million to 51.2 million (an increase of 203 per cent). Similarly, between 1989 and 1995/96, the population increased by about 17 million and the net entrants into the labour force was over 8 million.

definition of employment. During the period, the non-agricultural sectors were the main engine of job creation contributing nearly 60 per cent of the additional employment. Moreover, the bulk of the employment generation between 1989 and 1995/96 took place in the informal sector and currently nearly 60 per cent of the urban employment and about two-thirds of the rural employment outside agriculture are estimated to be in the informal sector.

Despite the overall increases in thc level of employment, significant imbalances in the labour market exist. The total civilian labour force increased from 50.7 million in 1989 to 56.0 million in 1995/96 (that is, by more than 10 per cent) while the number of employed persons during the period rose by about 9 per cent – from 50.1 million to 54.6 million. This indicates that the unemployment rate more than doubled over the period from 1.2 per cent to 2.5 per cent.[13] While 'open' unemployment is relatively low due to the dominance of the informal activities in the labour market and the compulsion of the vast majority of the poor households to earn subsistence for their survival, the problems of the labour market are manifested in the high rate of underemployment (Table 12). The problem of under employment reflects the fact that more than one-third of the employed persons work less than 35 hours a week, a low level for a developing country such as Bangladesh. Moreover, the situation seems to have deteriorated over time. During 1989, 43 per cent of the employed labour worked for less than 40 hours a week and the share increased to more than 49 per cent in 1995/96. This, combined with the relatively low female participation rate in the labour force (in 1995/96, the female participation rate for persons aged 10 and over as per the 'usual' definition of the labour force was only 18.1 per cent compared with 77 per cent for the males), indicates that the labour market in Bangladesh is characterized by the existence of significant 'surplus labour'.[14]

[13] The definition of unemployed persons used in the surveys is, however, somewhat unrealistic in the context of Bangladesh since only persons in the civilian workforce not doing any work at all (even an hour) and engaged as unpaid family helpers and working less than 15 hours during the reference week are treated as unemployed.

[14] The labour market has several other disquieting features as well e.g. disproportionately high unemployment rates for the youth. labour market discrimination against women, existence of child labour, and low education and skill level of the labour force. During 1995/96, around 80 per cent of the female labour force were unpaid family workers compared with 20 per cent for males, almost 20 per cent of the children (aged 5 to 9) were in the labour force and two-thirds of the working children were engaged in agriculture, forestry and fishery activities mostly as unpaid family helpers or day/casual workers, and 51 per cent of the labour force (aged 15 and over) had no education and another 25 per cent had education only at the primary level. See BBS 1998.

Table 12: Underemployment in Bangladesh, 1995/96

(Persons aged 15 and over)

Category	Bangladesh	Urban	Rural
Absolute unemployed persons ('000)	1,266	401	865
Unemployed persons (Unpaid workers < 15 hrs/week; '000)	1,802	163	1,639
Underemployed persons (<35 hrs/week; '000)	18,903	1,942	16,961
Total unemployed and underemployed ('000)	21,971	2,506	19,465
Underemployment rate (% of total labor force)	38.5	22.1	42.1
Male	13.7	10.9	14.5
Female	79.0	54.2	82.4
Unemployment and underemployment rate (% of total labor force)	39.2	24.6	42.5

Source: BBS 1998.

Wage developments during the period indicate that real wages have grown at a moderate rate of 2 per cent per year since the early 1990s. This has been lower than the productivity gains, estimated at around 2.5 to 3 per cent since the beginning of the trade liberalization. This tends to indicate that the share of wages in total national income may have declined over time in Bangladesh although no firm data on distribution of income by factors of production are available.

3.4 Trade Liberalization and Labour Market Developments

As we have indicated earlier, the growth performance of the Bangladesh economy indicates some acceleration in GDP growth in the 1990s which coincided with the post-liberalization period. Between 1973 and 1980, GDP grew by 2.8 per cent per year on an average which increased to 3.8 per cent in the 1980s. By contrast, GDP increased by an average of 4.8 per cent per year in the 1990s. The growth in real per capita income also accelerated during the 1990s. The per capita GDP in real terms increased by only 16 per cent between 1980 and 1990 but the increase was 34 per cent between 1990 and 2000. Another significant feature of the 1990s is the rapid increase in export earnings. While export earnings represented around one-third of total imports in 1979/80 and 40 per cent in 1989/90, the share was nearly 75 per cent in 1998.

Although it is difficult to assess the productivity trends in the economy due to lack of comparable data over the period, the available information indicates that the productivity growth has been insignificant during the first half of the 1980s. During the period, GDP grew

by 3.1 per cent per year while employment grew by 3.3 per cent. During 1989 to 1995/96, GDP increased by over 4 per cent per year compared with the employment growth of about 3 per cent indicating a small productivity gain. It seems likely, therefore, that the period of trade liberalization has witnessed some modest productivity gains.

The impact of trade liberalization policies on the labour market is difficult to infer since the outcomes are not straight forward in a country such as Bangladesh. Although the standard analysis in a labour abundant country like Bangladesh suggests that the demand for labour, especially in the formal sector, should increase as the trade restrictions are removed, the actual outcomes depend on the structure of the labour market.[15] Moreover, the skill characteristics and segmentation in the labour market are important elements in determining who benefits from the changes in the labour market. For example, a necessary pre-requisite for the poor labourers to benefit is that the production of tradable goods uses the unskilled workers as the most intensively used factor so that a positive impact on unskilled wages is created. Otherwise, wages of skilled (or semi-skilled) workers will increase with trade liberalization with those of unskilled workers remaining unchanged. In Bangladesh, the changes in agricultural wages are significant since unskilled workers in the rural areas form the largest majority of the poor in the country.

If we assume that the technology and other factors have a fairly constant impact on changes in employment and wages over the years, then an analysis of the trends in employment and wages can reveal some impact of trade liberalization in the labour market. We have compared the changes for two periods – late-1980s (1986-1990) and early-1990s (1991-1996) using available data and the results are given in Table 13. It shows that the period of the early-1990s, which was associated with rapid trade liberalization, was characterized by significant deceleration in the rates of employment creation in both agriculture and manufacturing sectors. The rate of increase in real wages also decelerated. During the period, agricultural growth declined to 2.2 per cent per year (compared with 2.8 per cent during the late-1980s) while manufacturing GDP grew by an annual rate of 9.5 per cent. The above results suggest that the period of the early-1990s witnessed significant adjustments in the labour market, particularly in its formal segment, whereby growth in

[15] For example, if the elasticity of labour supply is zero, wages will increase but not employment whereas, if the elasticity is infinite, employment will increase but not wages.

employment and real wages slowed down. In terms of growth, the urban economy seems to have gained from trade liberalization through higher growth in manufacturing output.

Table 13: Employment and Wage Rate Changes in Agriculture and Non-Agriculture Sectors in Bangladesh

(Average annual growth rate in per cent)

	1986-1991			1991-1996		
	GDP	Employment	Real wage	GDP	Employment	Real wage
Agriculture	2.8	2.2	3.2	2.2	0.8	1.9
Manufacturing	6.5	19.2	2.4	9.5	-6.2	1.6
Total	3.7	2.8	2.5	4.4	3.1	1.3

Source: BBS 1999, MOF 2001.

An important issue, moreover, is to see how the gains (in terms of income) have been shared. While the issue is the focus of analysis of the present study and will be further examined later on using a specifically adopted analytical framework, we present here some empirical evidence on how the incomes have been shared both spatially and by broad income groups. The data, presented in Table 14, show that the average per capita income in real terms increased by more than 40 per cent between 1986 and 2001.[16] However, the per capita

Table 14: Distribution and Changes in Real Per Capita Income

(Taka at 1995/96 constant prices)

Year	Per capita income			Ratio of the poorest 20% and the richest 20%
	Average	20 per cent richest households	20 per cent poorest households	
1985/86	11,199	25,780	3,914	0.15
1988/89	11,474	26,504	3,809	0.14
1991/92	12,286	27,564	4,005	0.15
1995/96	13,788	34,109	3,889	0.11
2000/01	15,788	41,104	4,855	0.12

Source: Author's calculations based on Household Expenditure Survey and national accounts data.

[16] The estimates are based on Household Expenditure Survey (HES) data on income distribution and income data of the national accounts. For example, the income of the poorest 20 per cent of the households is estimated as the product of national income times the share of these households as given in the HES income distribution. The per capita income is then derived by using the one-fifth of the total number of households and average household size. One limitation of the methodology is the neglect of the movements of the households across the income categories over different periods. Despite this caveat, the results show important aspects of income inequality.

income of the poorest 20 per cent of the households increased by only 24 per cent while the per capita income of the richest 20 per cent increased by nearly 60 per cent during the period. The percentage increase during the 1990s, moreover, is much higher for the 20 per cent richest households (49 per cent) compared with only 21 per cent for the 20 per cent poorest households. Similar increases during the earlier period (1986-1992) were 7 per cent for the richest 20 per cent households and less than 3 per cent for the poorest 20 per cent households. This indicates that the rich households gained relatively more during the period of liberalization relative to the poor households. The period also witnessed widening inequalities in the regional income distribution. Urban pockets of development e.g. Dhaka, Chittagong and Khulna enjoyed relatively better living standards (as measured by per capita GDP) during the 1990s compared with the rest of the country (Table 15). On the other hand, growth in several rural regions stagnated. Regional disparities, as measured by the coefficient of variation of regional per capita income, also increased.

Table 15: Regional Variation in Per Capita GDP

(Country average in 1989/90 = 100 at constant 1984/85 prices)

Region	1989/90	1998/99	Total variation
Dhaka	101.3	143.1	41.4
Mymensingh	84.0	107.1	23.1
Jamalpur	95.6	120.5	24.9
Tangail	91.2	114.5	23.3
Faridpur	98.2	122.1	23.9
Chittagong	151.9	202.4	50.5
Chittagong Hill Tracts	297.1	398.6	101.5
Noakhali	84.4	101.4	17.0
Comilla	93.6	119.1	25.5
Sylhet	98.6	127.3	28.7
Rajshahi	83.7	103.0	19.3
Dinajpur	96.4	115.2	18.8
Rangpur	84.4	103.1	18.7
Bogra	99.2	118.6	19.4
Pabna	73.0	93.3	20.3
Khulna	111.3	144.7	33.4
Barisal	105.2	120.0	14.8
Patuakhali	110.8	135.4	24.6
Jessore	97.3	125.2	27.9
Kushtia	98.0	120.3	22.9
Country average	100.0	131.0	31.0
Coefficient of Variation (per cent)	47.1	48.1	-

Source: BBS 1999.

The empirical evidence presented in this section suggests that, despite some positive developments, the gains associated with trade liberalization have been unevenly shared, both among various income groups and over different geographical regions, of the country. The critical policy issue for Bangladesh, therefore, is to enhance the overall gains from trade liberalization along with improving the access of all social groups to the benefits of globalization and growth. In the following sections, we shall examine the issues in terms of the general equilibrium framework developed under the study.

4. Objectives of the General Equilibrium Framework

The major objective of the framework is to examine and analyze the poverty and distribution impacts of the measures adopted by Bangladesh to integrate its economy to the rest of the world. More specifically, the framework intends to analyze the consequences of "globalization" measures on household poverty and income distribution. Understanding the impact of globalization measures is important for Bangladesh since it would help the policymakers in formulating and implementing countervailing measures that would offset, or at least reduce, the deleterious impact of the globalization measures on the poor households. Using the framework, the consequences of several measures (e.g. trade liberalization and the inflow of capital) on allocation of resources, distribution of income, and the poverty situation of different household groups have been examined. For the purpose, simulation exercises were conducted using the multi-sectoral, multi-factor and multi-households computable general equilibrium (CGE) model calibrated to the 1995/96 social accounting matrix (SAM) database of the Bangladesh economy.

5. Outline of the Methodology

The general methodology uses a framework of analysis which allows to examine the consequences of policy changes both at sectoral and macro levels and to estimate their poverty and distribution impacts at the household level. For the purpose, a computable general equilibrium (CGE) model has been employed which allows to examine the consequences of policy reforms within a constrained optimization framework. A Social Accounting Matrix (SAM) for the year 1995/96 has been developed to serve as the consistent and comprehensive database for the above-mentioned exercise.

5.1 The Bangladesh Social Accounting Matrix for 1995/96

As mentioned above, the CGE model has been numerically calibrated to a 1995/96 Social Accounting Matrix (SAM) for which the main sources of information are: (a) 1993/94 Input-Output Table prepared by the Bangladesh Institute of Development Studies (BIDS

1998); (b) Household Expenditure Survey (HES) 1995/96 by the Bangladesh Bureau of Statistics (BBS 1998); (c) 1995/96 Labour Force Survey (LFS) by the Bangladesh Bureau of Statistics (BBS 1998); and (d) National Income Estimates by the Bangladesh Bureau of Statistics (BBS). The major features of the SAM may be summarized as follows:

Accounts

The 1995/96 SAM identifies the economic relations in the economy through *four types of accounts*: (i) production activity accounts for 26 sectors; (ii) 7 factors of production with 6 different types of labour and one type of capital; (iii) current account transactions between 3 main institutional agents: households and unincorporated capital, the government, and the rest of the world; and (iv) one consolidated capital accounts to capture the flows of savings and investment by institutions and sectors respectively.[17]

Activity

The activity account has been represented by 26 producing activities. These are derived from the 79 sectors of the 1993/94 input-output table. Due to lack of adequate information, no distinction has been made between activity and commodity and hence they are synonymous in the SAM.

Households

An important feature of the SAM is the decomposition of the households into 7 groups. The household groups differ with respect to employment status, income levels and expenditure patterns. Pyatt and Thorbecke (1976) have suggested location, sociological and wealth criteria to classify the household groups[18]. In our case, location (rural-urban), land ownership, occupational status, and the level of education information, contained in the 1995/96 HES, has been used for household classification.

[17] The details of the SAM are provided at Appendix 2.

[18] For instance, the location criterion which distinguishes a household as urban or rural is useful since it captures many aspects of duality. Depending on this distinction, individuals with otherwise similar characteristics are likely to be paid different wages, have different job opportunities and employment expectations and generally be subject to different sets of parameters in their socio-economic behaviour (Pyatt et al, 1984).

Labour Factor

The 1995/96 SAM also accounts for decomposition of the labour factor into 6 groups based on gender and skill level of the workers. The labour factor classification is important to examine the consequences of policy measures on "factorial" income distribution. The information on the level of education and gender, contained in the 1995/96 LFS, has been used for labour factor classification.

The disaggregation of factors, households, activities and institutions in the SAM and the CGE model is given in Table 16.

Table 16: Disaggregation and Description of Factors, Institutions and Households

Set	Description of Elements
Factors of Production	
Labour (6)	• **Female**: 3 categories according to skill levels (low, medium and high) Low: grades 0-5; Medium: grades 6-10; High: grades 11 and above • **Male**: 3 categories according to skill levels (low, medium and high) Low: grades 0-5; Medium: grades 6-10; High: grades 11 and above
Capital (1)	• 1 type only
Institutions	
Households (7)	• **Rural** *Agriculture*: 3 categories according to land ownership Labourer household: 0-0.49 hectares; Small Farmers: 0.5-2.49 hectares, Large Farmers: >2.5 hectares. • **Rural** *Non-Farm*: 1 category according to occupation • **Urban**: 3 categories according to the level of education of the household's head Low Skilled: grades 0-5; Medium Skilled: grades 6-10; and Professional: grades 11 and above
Others (2)	• Government • Rest of the World
Activities	
Agriculture (7)	• **Crops** *Non-traded*: Rice (Aman and Boro) • **Crops** *Traded*: Other Grains and Commercial Crops • **Non-crops** *Non-traded*: Forestry • **Non-crops** Traded: Livestock and Fish
Industries (12)	• **Food Processing** *Traded*: Rice Milling, Atta and Flour, Other Food and Tobacco • **Textiles** *Traded*: Clothing, Ready Made Garments and Leather. • **Others** *Traded*: Chemicals, Fertilizer, Petroleum Products, Machinery and Miscellaneous Industries
Services (6)	• *Non-Traded*: Construction, Gas, Trade Services, Social Services, Public Administration, Financial Services and Other Services

5.2 The CGE Model

The computable general equilibrium (CGE) models capture the detailed accounts of the circular flows of receipts and outlays in an economy. It satisfies the general equilibrium conditions in the markets simultaneously. Given the framework, such models are useful to analyze the associations among various agents of the economy.

In line with most of the CGE models, the present model has been solved in the comparative static mode which provides an instrument for controlled policy simulations and experiments. The solution of each simulation presents the complete sets of socio-economic, meso and macro level indicators such as activity/commodity prices, household incomes and expenditures, factor demand and supplies, gross domestic products, exports and imports, and household poverty situation. To begin with, the model was calibrated to the 1995/96 SAM to exactly reproduce the base year values[19].

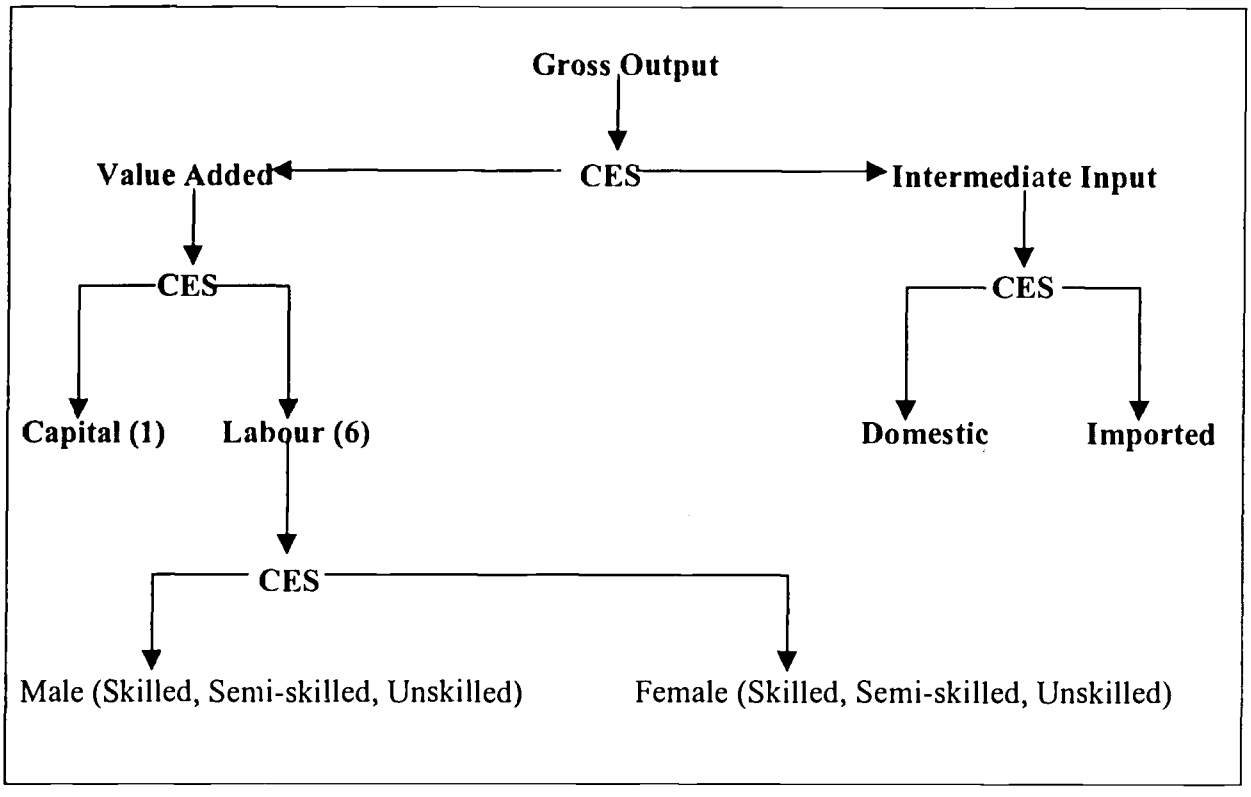
The structure of the model and its main features are discussed below. The schematic presentation of the production structure and the structure of demand are shown in Figure 1 and Figure 2 respectively.

The Production Structure

The nested production structure in each sector is presented in Figure 1. At the top level, the real value added and the intermediate inputs are combined via a Constant Elasticity of Substitution (CES) production function to produce the gross output. At the bottom level, there are two CES functions: one for labour and capital factors to produce the real value added and one for imported and domestic intermediates to generate composite intermediate inputs.

[19] In the calibration procedure, most of the model parameters are estimated endogenously keeping the various elasticity values fixed.

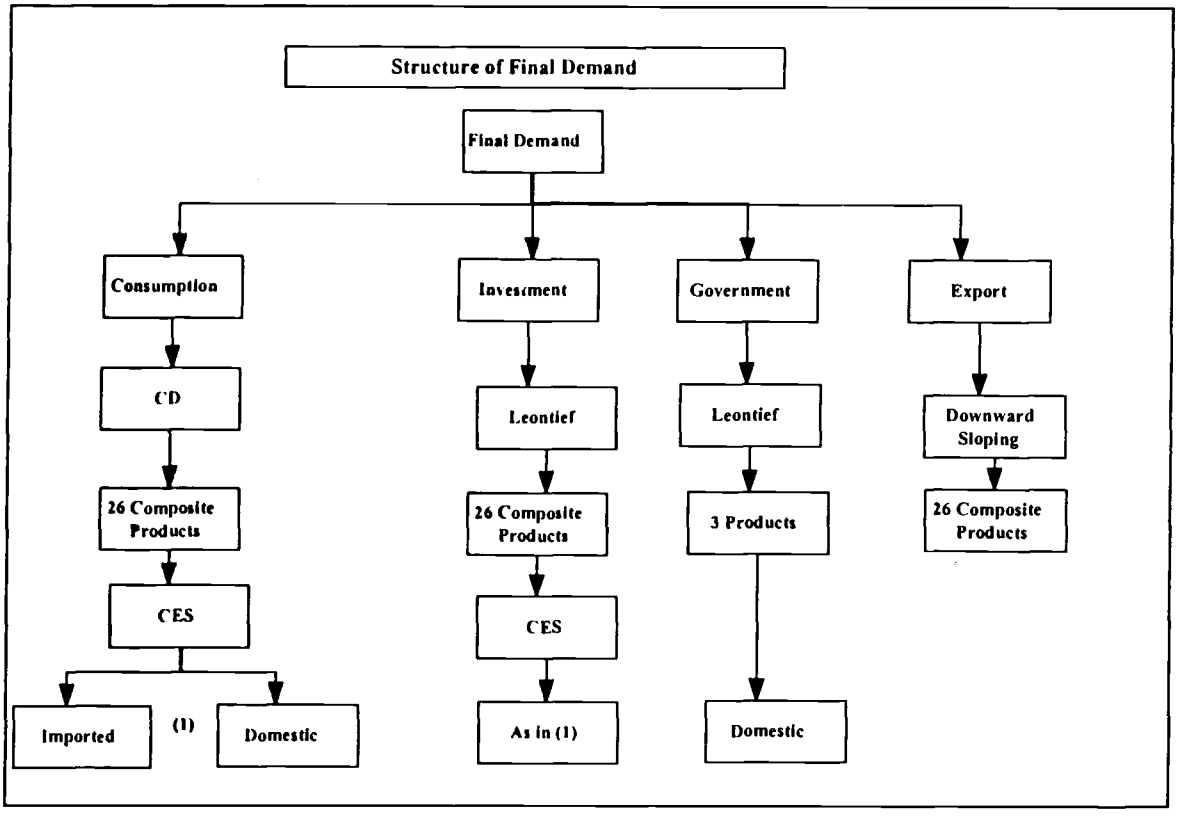
Figure 1: Structure of Production



The Demand Structure

The structure of demand is presented in Figure 2. It shows the demand for private and public consumption expenditures, investment demand and exports demand. The private consumption demand is specified by a Cobb-Douglas function which is combined with a nested CES function of composite products. The distribution of investment by sector is modeled using a fixed-coefficient specification. The Leontief specification applies to both domestically produced and imported investments. The formulation of investment function is static: there is no link between increased savings at the current period and additional investment in a subsequent time period. In a dynamic model, a policy which has a negative impact on welfare in the current period, may yield substantial welfare gains in the long run. These inter-temporal features, however, have not been explicitly considered in the present structure of the model. The total government expenditure has been taken to be exogenous. The distribution of government expenditure by sectors has been modeled using a fixed-coefficient specification. The export demand is specified by a downward sloping world demand for exports.

Figure 2: Structure of Final Demand



System Constraints and Equilibrium Conditions

There exist four constraints in the system of the specified model. The real constraint refers to domestic commodity and factor market; whereas the nominal constraint represents two macro balances: the current account balance of the rest of the world and the savings-investment balance.

The sectoral supply in the model is a composite of imports and outputs sold in the domestic market. The composite demand, on the other hand, includes final demands (i.e. private and public consumption expenditure and investment) and intermediate input demands. The variations in the sectoral prices assure equilibrium between sectoral supply and demand in the model.

In the case of the factor market, it is generally assumed that total quantities of factor supply are fixed and hence variations in factor returns (i.e. wages and rents) ensure the equilibrium between the factor demand and the fixed supply. This specification implies the existence of full mobility of the factors across the producing activities specified in the model.

However, given the comparative static and short-run nature of our analysis, the full mobility specification is adopted for the six types of labour factors where variations in their wages assure the equilibrium in the labour market. However, capital is not treated as mobile rather it is taken as sector specific and hence the capital market equilibrates through explicit parameters that allow for differential rents for different sectors.

The inflows (transfers to and from domestic institutions) are specified as fixed but imports and exports are determined endogenously in the model. The foreign savings is also taken as fixed in this model and nominal exchange rate is allowed to vary to clear the foreign exchange market. In this case, the equilibrating variable is the nominal exchange rate. Under the specification, fixing of foreign savings is equivalent to keeping the trade deficit fixed.

Finally, for the savings-investment equilibrium, the model treats the investment decision as given and hence savings adjust to ensure its equality to the fixed value of the investment. The basic approach is to allow the savings propensity of one of the domestic institution to vary. The main features of the model are summarized in Table 17.[20]

Table 17: Summary of Model Features

- Labour factor is mobile across producing activities.
- Capital is immobile and sector specific.
- Primary factor supplies are exogenous and fixed.
- The world prices of imports and exports are exogenous invoking the small country assumption.
- Current account balance or deficit is fixed.
- Imports and domestically produced goods are imperfect substitutes.
- Output produced for domestic and export markets reflects differences in quality.
- Savings of domestic institution adjust to equate to given investment.
- General price index acts as the numeraire.
- Excess demand conditions are satisfied.

[20] For a summary of the equations of the model, see Appendix 1.

6. Simulation Designs

For policy analysis, two simulations have been conducted to examine the impacts of globalization measures on poverty and income distribution of the seven representative household groups. These simulation designs are done in line with the measures of globalization adopted in Bangladesh and discussed in section 2 of the study.

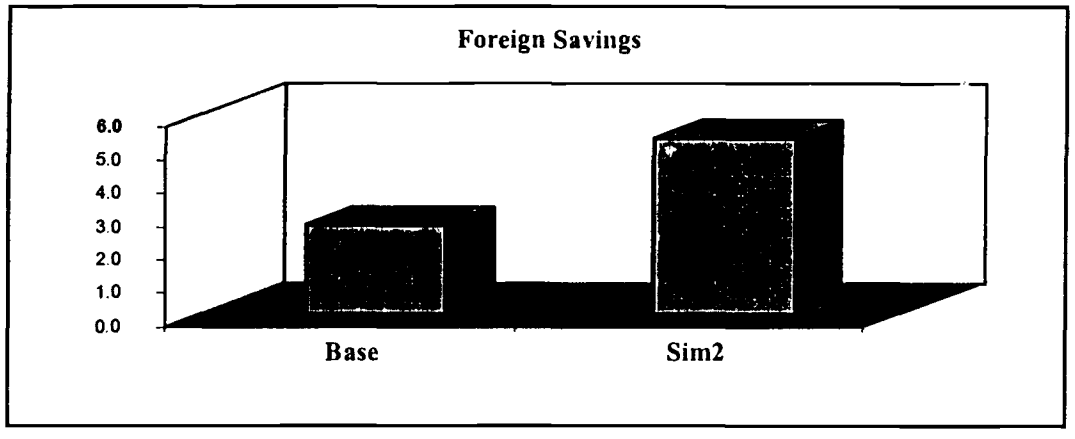
Simulation 1 (Sim1): In the first simulation, the base values of the tariff rate are set equal to zero to encourage the volume to trade to expand such that the "openness" indicator of globalization is enhanced. Consequently, the base values of all other parameters are retained. The base and simulation values of the tariff rates are presented in Table 18.

Table 18: Tariff Rates for Base Year and Simulation Experiment

	Base Year		Simulation 1	
	Import values	**Tariff Revenues**	**Tariff Rates**	**Tariff Rates**
Grains	4.21	0.69	16.51	0.00
Commercial Crops	7.49	0.54	7.18	0.00
Livestock	2.34	0.00	0.00	0.00
Fish	0.00	0.00	0.00	0.00
Forestry	0.00	0.00	0.00	0.00
Rice Milling	0.57	0.02	3.43	0.00
Ata and Flour Mill	0.04	0.00	12.16	0.00
Other Food	8.39	3.14	37.42	0.00
Leather	0.28	0.00	0.00	0.00
Cloth	22.90	5.59	24.42	0.00
Ready Made Garment	1.37	0.04	2.96	0.00
Tobacco	0.11	0.002	2.04	0.00
Chemical	24.01	5.04	20.98	0.00
Fertilizer	2.84	0.00	0.08	0.00
Petroleum Products	9.78	4.61	47.15	0.00
Machinery	70.98	12.69	17.88	0.00
Miscellaneous Industry	99.01	6.62	6.69	0.00
Average	**254.33**	**39.00**	**15.33**	**0.00**

Simulation 2 (Sim2): In the second simulation, the base value of foreign savings is augmented to reflect the pattern of foreign investment inflow into Bangladesh during the last few years. The inflows of foreign investment are concentrated mainly in the "gas" sector depicting the rise in "foreign investment to GDP ratio" (e.g. investment indicator of globalization) as well as to assess impacts of such investment. As a result of such inflow of capital there is usually a primary resource boom in the country where the resource is effectively in an enclave. The direct outcome of this is the repatriation of export earnings leading to rise of domestic prices relative to world prices and the contraction of tradable sector relative to non-tradable sector. The base values of all other parameters are retained. The base and simulation values of the foreign savings are presented in Figure 3.

Figure 3: Ratio of Foreign Savings to GDP



7. Simulation Results

The major results of the simulations are discussed in this section. For this, the simulation outcomes have been presented under three main headings: impacts on selected macro variables; welfare effects; and poverty implications.

Impacts on Macro Indicators:

The impacts on selected macro indicators are reported in Table 19.

The real GDP growth in *simulation one* is 2.43 percent compared with the base case. The complete elimination of the tariffs (which were mainly concentrated on a few manufacturing sectors) led the resources to move from the protected (i.e. manufacturing) to the unprotected sectors (i.e. agriculture and services). Such a reallocation of resources to the unprotected

sectors resulted in higher growth of agriculture (0.73 per cent) and service (0.84 per cent). The experience of the manufacturing sector is mixed with respect to growth and allocation of resources. Resources have moved from some manufacturing sectors and these are the major losers of the tariff elimination experiment. Such sectors belong to the "import-substituting" type of manufacturing activities. On the other hand, the elimination of tariff rates depreciated the nominal exchange rate , which helped to increase Bangladesh's exports. Thus, resources also moved to the export oriented manufacturing sectors and led to their growth. The net effect on the manufacturing activity is the growth of the sector by 0.86 percent compared with the base case.

Table 19: Selected Macro Effects of the Simulations with the Model

	Shares (%)	**Growth Rates (%)**	
	Base Case	*Simulation 1*	*Simulation 2*
Real GDP		**2.43**	**0.21**
Agriculture	0.22	0.73	-0.004
Manufacturing	0.22	0.86	-0.93
Service	0.56	0.84	1.14
Traded	0.33	1.40	-1.13
Non-traded	0.67	1.03	1.33
Consumption		**1.38**	**0.95**
Imports		4.23	12.89
Exports		14.77	-11.19
Trade Openness		**29.54**	**28.62**

The observed pattern of manufacturing sector growth is reflected in high growth of the export sector by nearly 15 percent compared to the base case. The growth of imports by 4 per cent is moderate considering the full elimination of tariffs. Substantial depreciation of nominal exchange rates countered the large fall in the domestic import prices. These two opposing impacts on the domestic import price resulted in the moderate increase in import by about 4 per cent.

The patterns of growth effects under the *second simulation* are different from the first simulation. In the second simulation the resources moved from both agriculture and manufacturing sectors to generate growth in the service sector. As expected the pattern of resource reallocation resulted in the growth of non-traded sectors (1.33 per cent) at the expense of the traded sectors (-1.13 per cent).

The growth of imports has been relatively high (13 per cent) in the second simulation. The decline of domestic manufacturing and agriculture activities manifested in higher prices of domestic products relative to the import price of their import substitutes. This led to the substantial growth of imports in the simulation. Similarly, higher prices of domestic supplies compared to the export prices manifested in sharp decline of exports (11 per cent) in this case compared to the base case.

Welfare Effects:

The concept of efficiency or welfare is the starting point of any policy analysis. Unlike in a theoretical approach where an ordinal measure of alternative states is examined, some measures of welfare are employed in applied policy analysis to compare the movement from one state to another.

In applied policy analysis, this is done through using some monetary representation of the individual utility functions which is defined as the amount of money required to attain a level of utility at a reference price vector. This is termed as the money metric, and its value is derived from the expenditure function. The expenditure function, which is the inverse of the indirect utility function, is a vital tool for such an welfare analysis which allows the "measurement of utility". Since the value of the expenditure function depends on the set of prices used, there are different money metrics which one can use. The most widely used ones are, however, the compensating variation (CV) and the equivalent variation (EV). These are commonly used due to their easy interpretation in terms of the compensated demand curves. In the EV approach, the idea is to measure in money terms, how much income needs to be given to the consumer at the "pre-policy change" level of prices (P_0) in order to enable him to enjoy the utility level which arises after the policy change is effected ("post-policy change level of utility"). The CV, on the other hand, uses the post-policy prices (P_1). It thus measures the income change necessary to compensate the consumer for the changes in prices[21]. In the present exercise, the Equivalent Variation (EV) has been used as a measure of welfare to examine welfare impacts of the simulations. The results are given in Table 20.

[21] In a many consumer economy, the use of aggregate EV or CV as a measure of welfare changes, although avoids any explicit Social Welfare Function (SWF), has an implicit SWF because of the adding up approach. Boadway and Bruce (1984) show that there are some well-known problems in interpreting the aggregate EVs or CVs and one needs to be careful in interpreting the result of such measures. The social ordering requires more data and judgment than do household ordering and it may not be possible to measure changes in welfare simply on the basis of household orderings of social status drawn from their market behaviour. When EV is used as a measure of welfare, it is implicitly assumed that aggregate market behaviour is generated by a single household whose preferences coincide with the social ordering.

Table 20: Welfare Impacts of Simulations: Equivalent Variations for Different Household Groups

	Base value	Simulation 1		Simulation 2	
Household Groups	*Consumption (Billion Tk)*	*Consumption Growth (%)*	*EV*	*Consumption Growth (%)*	*EV*
Agricultural Labourers	95.59	1.25	1.19	0.75	0.71
Small Farmers	176.25	1.36	2.54	1.06	1.97
Large Farmers	188.63	1.35	2.93	1.45	3.13
Non-farms	268.77	1.33	3.9	0.91	2.65
Worker-Low Skilled	168.94	1.41	2.47	0.89	1.56
Worker-Medium Skilled	151.75	1.46	3.03	0.89	1.84
Professionals	329.07	1.35	5.57	0.76	3.10
Total	**1379.00**	**1.36**	...	**0.95**	...

It can be observed that, in *both simulations*, Equivalent Variations (EVs) are positive for all household groups. The positive EV values are the manifestation of positive real GDP growth and consumption growth. Except for the non-farm household group, the observed EV is larger for the relatively high-income household groups (e.g. professionals, medium skilled workers, and large farmers) compared with the low-income household groups (agricultural labourers, low-skilled workers and small farmers). This suggests that the welfare gains emanating from the "globalization" measures accrued more to the well-off household groups compared to their less well-off counterparts. Among the less well-off household groups, only the non-farm group is observed to benefit due to their higher participation in non-traded and service activities which exhibit high growth under the simulations.

Poverty Implications:

In the present exercise, Foster-Greer-Thorbecke (FGT) measure of poverty has been used to evaluate the policy effects on poverty profiles of the representative household groups. The measurement of poverty profiles has been done following the method adopted by Decaluwe et al (1999). Specifically, the methodology requires: (a) explicit proposition of income distribution formulation corresponding to each household group's characteristics and (b) postulation of an unique and constant basket of basic needs based poverty line whose monetary value is altered by endogenously determined commodity prices. The derivation of poverty profiles of the representative household groups in the present study follows the above methodology for which the major steps are summarized below:

1. The income distribution formulation under the approach depends on the "minimum" and the "maximum" incomes and on the skewness of the distribution. The "Beta" distribution function (equation 1) has been used to represent these characteristics of the household groups. The implementation of "Beta" distribution requires minimum (mny) and maximum (mxy) incomes within each of the seven groups and values of shape and skewness parameters (i.e. p and q) of the distribution..

$$I^h(y^h, p^h, q^h) = \frac{1}{B^h(p^h, q^h)} \cdot \frac{(y^h - mny^h)^{p^h-1} \cdot (mxy^h - y^h)^{q^h-1}}{(mxy^h - mny^h)^{p^h+q^h-1}}$$

$$B^h(p^h, q^h) = \int_{mn^h}^{mx^h} \frac{(y^h - mny^h)^{p^h-1} \cdot (mxy^h - y^h)^{q^h-1}}{(mxy^h - mny^h)^{p^h+q^h-1}} dy \qquad (1)$$

2. The 1995/96 Household Expenditure Survey (HES) of the Bangladesh Bureau of Statistics (BBS), which is a representative survey for the country as a whole, was used to derive the household classification scheme and subsequent derivation of the values (p,q) and the values of the minimum and maximum incomes for each household group. In the survey, these data were recorded in nine sets that are referred to as cards. The layout is given in Table 21.

Table 21: Data Layout in the 1995/96Household Expenditure Survey

Attribute	Card	Sample of 7,420 households with 39,051 members
Household Structure	1	Sex, relationship, age, marital status, work status, occupation, activity, activity code, industry code;
	2	Land property, housing, sanitation, electricity, water supply, occupational status;
Expenditure	3	Permanent and temporary expenses (fuel & light, gas, washing & cleaning, communication & travel, miscellaneous items);
	4	Other monthly expenses (house rent, educational and medical expenses and other miscellaneous expenses.);
	9	Daily expenses on food items
Income	5 6	Agricultural and related activities
	7	Other sources of income
Community	8	Demographic characteristics, agricultural practices, quality of social and physical infrastructure, availability of schools and health facilities, access to various amenities and development programmes and activities by the Government and NGOs

Excluding the missing records, the total sample size was 39,044 of which 26,446 belonged to the rural location and 12,598 to the urban location.[22] For computing the above parameters, the data records in the HES were grouped. The 'betafit' function was applied in the 'MATLAB' environment to derive ***p*** and ***q*** values for the household groups. The steps followed are outlined below:

- Sorting each household group in ascending order of income.
- Derive maximum and minimum income for each household group.
- Derive mean income for each decile group within each household category.[23]
- The following formula was then applied to each decile group of a particular household category:

  $$(mean_i - min) / (max - min)$$

  Where, $mean_i$ = mean income of the i_{th} decile of the household group.

  min = minimum income of the household group.

  max = maximum income of the household group.

  Thereby, we got a vector *(x)* consisting of 10 values corresponding to each decile group of a particular household.
- The vector '*x*' was created in MATLAB environment.
- The command *"phat=betafit (x)"* was applied to generate corresponding '***p***' and '***q***' values for each household group.
- The '***p***' and '***q***' values were then used in the integral formula of poverty estimation in the *'Mathematica'* environment for poverty estimates.

The reported minimum and maximum incomes and the estimated values of p and q parameters are reported in Table 22.

3. The derived distribution has been employed to assess the poverty implication within each of the household groups. For our purpose, it has been assumed that, following a policy change, intra-group distributions shift proportionally due to mean income change implying the constancy of intra-group distributions. That is, if the mean income changes

[22] We used the exhaustive method. For the rural sample, 7 out of 26,453 values were found to be missing while classifying them as per our classification criteria. So, we excluded them from the sample. The number, however, is too small to affect our estimates.

[23] In this case we used 10 decile groups for each representative household group.

by a factor k, the income of each group within each household groups is also altered by the same factor. Analogously, the minimum and maximum incomes of each household group will also alter. The income effects of the simulations are provided in Table 23.

4. In order to derive the poverty profiles, the per capita income of each household group has been contrasted with the poverty line. For the purpose, two poverty lines applicable for rural and urban locations have been defined to capture price and other characteristics. The poverty lines (z in equation 3) have been determined endogenously within the CGE model by a basket of quantities of commodities reflecting the basic needs (BN). Although, the basket (ω_i^l) remains invariant under different simulations, the commodity price (P_i) changes to alter the monetary values of the poverty lines. A rise in commodity prices shifts the poverty line to the right (compared to the base case) and vice versa.

Monetary Poverty Line: $$z^l = \sum_i^l \omega_i^l \cdot P_i \qquad (2)$$

5. The above estimates (Beta distributions and poverty lines) have been used in the FGT poverty measure to derive pre- and post-simulations poverty incidence for the 7 representative household groups. The FGT class of measures satisfies the desirable axioms and allows us to measure poverty incidence for different groups that adds up to the total.[24] The FGT index ($P\alpha$) also allows us to generate three measures of poverty: Head Count Index (when $\alpha = 0$); Poverty Gap Index (when $\alpha = 1$) and Squared Poverty Gap Index (when $\alpha = 2$). The simplest measure of the incidence of poverty, headcount ratio, is the proportion of population with a per capita income below the poverty line. The depth of poverty is measured by the poverty gap index, which estimates the average distance separating the income of the poor from the poverty line as a proportion of the income indicated by the poverty line. The severity of poverty, as measured by the squared poverty gap index, quantifies the aversion of the society towards poverty. This implies an increase in "our measured poverty due to a fall in the standard of living will be greater the

[24] Any poverty measure is expected to satisfy the following three desirable axioms. (1) Focus axiom, which requires poverty measures to be insensitive to increase in income of a non-poor person. (2) Monotonocity axiom which refers to the condition where a reduction in a poor person's income should increase the value of the poverty measure; and (3) Transfer axiom, which demands that, *ceteris paribus*, a transfer of income from a poor person to a richer person should raise the value of the poverty index. For details see Subramanian (1997).

poorer you are" (Ravallion, 1994). These three measures for rural and urban household groups can be computed using the following formula:

$$P_\alpha^h = \int_{mny^h}^{z^l} \left(\frac{z^l - y^h}{z^l} \right) \cdot l^h(y^h, p^h, q^h) dy^h \qquad (3)$$

where,

$l \in$ {rural, urban} refers to location;

$h \in \{1,2, \ldots, 7\}$ refers to the 7 households groups;

P_α^h is the FGT index by household groups;

Base Year Poverty Profiles:

The base year poverty profiles of the household groups and in rural and urban locations are provided in Table 22. The main features may be summarized as follows:

(i) Almost 54 percent of the rural population are poor while, in urban areas, it is around 29 percent. This suggests that the incidence of poverty in rural areas is much higher than that in urban areas. Moreover, the depth and severity of poverty, as measured by the poverty gap and the squared poverty gap indexes, are observed to be worse in rural areas.

(ii) Among the rural households, the agricultural labourers form the most deprived group. More than 78 per cent of them are poor. In terms of poverty gap and squared poverty gap, they also constitute the most vulnerable group. The group is closely followed by the small farmers and the non-farm households in terms of incidence of poverty.

(iii) A significant share of the population of the large farmers group lives below the poverty line as indicated by the head count ratio of the group (0.293). However, the values of the poverty gap (0.097) and the squared poverty gap (0.047) suggest that most of the poor in the group are marginally poor and a relatively small increase in their income would graduate a significant portion of them out of poverty.

(iv) As expected, the incidence of urban poverty is concentrated mostly among the low skilled workers. More than 37 percent of the low skilled workers have income less than the urban poverty line. Moreover, relatively high values of the poverty gap and the squared poverty gap (0.14 and 0.07 respectively) of the group indicate higher

vulnerability of these workers compared with other urban groups. The incidence of poverty is low for other two urban household groups.

Table 22: Base Values of Household Poverty Profiles

	Income (Tk per capita per month)				Population	Beta		FGT Poverty Measure		
Household	Minimum	Maximum	Mean	Poverty line	Share (%)	p	q	Head Count	Poverty Gap	Squared Poverty Gap
Rural	18	9140	697	650	78.65	2.9	37	0.535	0.197	0.099
Agricultural Labourers	73	4245	507	650	29.63	2.9	26	0.781	0.305	0.153
Small Farmers	152	6369	694	650	21.65	2.3	24	0.523	0.164	0.070
Large Farmers	18	9140	981	650	11.32	2.7	22	0.293	0.097	0.047
Non-farms	91	6935	721	650	37.41	2.3	22	0.486	0.168	0.079
Urban	73	26533	1359	725	21.35	1.7	33	0.287	0.109	0.057
Workers-Low Skilled	73	16376	987	725	58.60	2.3	38	0.377	0.136	0.066
Workers-Medium Skilled	441	14833	1884	725	21.92	1.3	11	0.107	0.019	0.005
Professionals	358	26533	2927	725	19.48	1.4	12	0.062	0.013	0.004
National	*30*	*12854*	*838*	*665*	*100*	*2.0*	*56*	*0.482*	*0.178*	*0.089*

Post Simulation Poverty Profiles:

Among others, the incomes of the representative household groups and the commodity prices are altered as a result of the policy changes under the simulations. The changes in incomes and prices also change the minimum and maximum incomes within each household group and the monetary values of the rural and urban poverty lines. The estimated post simulation values of the minimum and maximum incomes and the poverty lines are given in Table 23.

Table 23: Income Effects Under Alternative Simulations

	Simulation 1				Simulation 2			
Household Groups	Minimum	Maximum	Mean	Poverty line	Minimum	Maximum	Mean	Poverty line
Rural	23	11,614	886	806	20	10,242	780	728
Agricultural Labourers	93	5,404	646	806	82	4,770	570	728
Small Farmers	193	8,100	882	806	170	7,141	778	728
Large Farmers	23	11,614	1,247	806	20	10,242	1,099	728
Non-farms	116	8,831	918	806	102	7,763	807	728
Urban	93	33,826	1,734	899	82	29,595	1,516	812
Workers-Low Skilled	93	20,837	1,256	899	82	18,360	1,107	812
Workers-Medium Skilled	565	18,990	2,412	899	490	16,474	2,092	812
Professionals	456	33,826	3,731	899	399	29,595	3,265	812
National	*38*	*16372*	*1067*	*826*	*33*	*14374*	*937*	*746*

These estimated values of income and the new prices generated under the simulations have been used in the FGT index (equation 3) to derive the post simulation poverty profiles. The poverty profiles under the two simulations are presented in Table 24 from which the following major impacts of the changes may be identified:

(i) Due to relatively high growth of income in the *first simulation,* poverty status of all household groups has improved. The gain, however, is marginally higher for the urban households compared with the households who reside in the rural location. The highest gains, in terms of reduction of poverty, are observed for the relatively well-off household groups. The highest reduction in poverty is observed for the medium skilled households (10 per cent), followed by the professionals (7 per cent) and the large farmers (4 per cent) groups. One reason for the relatively higher gains in terms of poverty reduction for these groups is the fact that the depth and the severity of poverty were not intense, to begin with, for these relatively well-off household groups. Therefore, a small increase in real income has been able to move a significant portion of the poor population of these household groups out of poverty as compared with the less well-off households whose depth and severity of poverty are more intense.

(ii) In the second simulation, the poverty situation in the rural location improved in contrast to the generally worsening poverty situation in the urban location. The head count index of poverty declined by 0.11 percent in the rural location which increased by 0.42 percent in the urban location. One important observation, however, is that the poverty situation worsened for all relatively well off household groups except the large farmers. The rise in the incidence of poverty can be specifically noticed for the medium skilled workers (2.5 per cent), and the professionals (1.2 per cent) households. The relatively large decline in the manufacturing income in the simulation led to a reduction in the real incomes of these two household groups. The fall has been manifested in widening of the poverty gap, deepening of the severity of poverty and worsening of the head count index.

Table24: Impacts of Policy Simulations on Poverty Profiles

	Simulation 1			Simulation 2		
Household Groups	Head Count P_0	Poverty Gap P_1	Severity P_2	Head Count P_0	Poverty Gap P_1	Severity P_2
Rural	0.514	0.187	0.094	0.534	0.196	0.099
Agricultural Labourers	0.762	0.293	0.145	0.778	0.304	0.152
Small Farmers	0.503	0.155	0.065	0.522	0.164	0.065
Large Farmers	0.280	0.092	0.044	0.293	0.097	0.046
Non-farms	0.468	0.160	0.075	0.486	0.168	0.079
Urban	0.276	0.104	0.054	0.288	0.110	0.058
Workers-Low Skilled	0.363	0.124	0.059	0.377	0.130	0.063
Workers-Medium Skilled	0.097	0.016	0.004	0.110	0.020	0.005
Professionals	0.058	0.012	0.004	0.063	0.014	0.004
National	*0.463*	*0.169*	*0.855*	*0.481*	*0.177*	*0.902*
	Percentage Change from the Base Run					
	Head Count P_0	Poverty Gap P_1	Severity P_2	Head Count P_0	Poverty Gap P_1	Severity P_2
Rural	-3.82	-4.93	-5.57	-0.11	-0.30	-0.53
Agricultural Labourers	-2.32	-4.10	-5.18	-0.27	-0.49	-0.61
Small Farmers	-3.73	-5.34	-6.53	-0.08	-0.06	-6.53
Large Farmers	-4.21	-4.86	-5.57	-0.02	0.00	-0.28
Non-farms	-3.75	-5.00	-5.88	0.052	0.052	0.045
Urban	-3.84	-4.52	-5.01	0.42	0.80	0.95
Workers-Low Skilled	-3.74	-9.10	-9.71	0.00	-4.33	-4.37
Workers-Medium Skilled	-9.64	-13.52	-19.06	2.49	3.82	5.14
Professionals	-6.92	-9.52	-11.99	1.17	1.68	2.18
National	*-3.90*	*-4.89*	*-3.98*	*-0.11*	*-0.20*	*1.40*

8. Concluding Observation

In the present study, two simulations have been conducted to examine the impacts of globalization measures on poverty and income distribution of seven representative household groups in Bangladesh. In the first simulation, the base values of the tariff rate have been set equal to zero to encourage trade expansion such that the "openness" indicator of globalization is enhanced. The base values of all other parameters are retained. In the second simulation, the base value of foreign savings has been augmented to reflect the recent pattern of foreign investment inflow into Bangladesh. The inflows of foreign investment, however, are concentrated mainly in the "gas" sector depicting a rise in "foreign investment to GDP ratio" (e.g. investment indicator of globalization) as well as invoking deleterious impacts of such investment. The base values of all other parameters have been retained. The simulation results highlight several macro and poverty impacts.

The real GDP growth in *simulation one* is 2.43 percent compared with the base case. Moreover, the reallocation of resources to the unprotected sectors manifests in higher growth of agriculture and service sectors. The resources are also observed to move to export oriented manufacturing sectors resulting in their higher growth. The pattern of manufacturing growth led by export-oriented industries results in high growth of the export sector. The increase in imports is observed to be moderate despite the full elimination of tariffs due to substantial depreciation of the nominal exchange rate which countered a large fall in the domestic prices of imports.

The growth effects under the *second simulation* are somewhat different from similar effects of the first simulation. In the second simulation, the resources move from both agriculture and manufacturing sectors to generate growth in the service sector. The growth of imports is relatively high due to the decline in domestic manufacturing and agriculture activities resulting in higher prices of the domestically produced products relative to the import prices of their import substitutes. Similarly, higher prices of domestic supplies result in sharp fall in exports in the simulation.

In the case of welfare measures, Equivalent Variations (EV) are positive for all household groups. The EV values reflect growth in real GDP and consumption. Except for the non-farm household group, the observed EV is larger for the relatively high-income household groups (e.g. the professionals, the medium skilled workers, and the large farmers) compared with the low-income households (agricultural labourers, semi-skilled workers and the small farmers). This suggests that the welfare gains emanating from "globalization" measures accrue more to the well-off household groups compared with their less well-off counterparts. Among the less well-off household groups, only the non-farm groups are observed to benefit due to their wider participation in non-traded and service activities.

In terms of the impact on poverty, the poverty situation of all household groups is observed to improve in the first simulation due to relatively high growth of income that results from the policy change. The urban households gain more than the rural households and the gains in terms of poverty reduction accrue more to the relatively well-off households. The highest reduction in the incidence of poverty is observed for the medium-skilled workers followed by professionals and large farmer households.

In the *second simulation*, poverty situation in the rural location improves while it somewhat worsens in the urban location indicating a contrasting pattern for rural-urban locations. Moreover, the poverty indicators under the simulation indicate worsening of the poverty situation for the relatively well-off household groups except for the large farmers. In particular, the medium-skilled workers and the professionals experience higher incidence of poverty due to resource reallocations from agriculture and manufacturing sectors to the service sector.

What policy conclusions can we draw from the above results? The underlying premise for promoting globalization in Bangladesh, as elsewhere in the world, rests on standard arguments: wider involvement and greater integration of the domestic economy with the global economy will benefit the country through improved external competitiveness, increased exports, and higher economic growth. The process also brings with it the potential to relax several constraints that Bangladesh faces such as a small domestic market, low savings, and limited access to technology and finance. The inflow of foreign direct investment can benefit the country by facilitating technology transfer, improving the managerial and technical skills, and accessing the global marketing networks. Although such 'growth' arguments are important considerations, the equity and poverty implications of globalization have significant policy relevance in Bangladesh in view of the central place of poverty reduction in its development priorities. The analysis in the present study indicates that, while the globalization efforts in Bangladesh are generally pro-poor, the gains are relatively small and these differ across various household groups in the presence of structural bottlenecks and other constraints. In particular, the gains accrue more to the relatively well-off households while the extreme poor households benefit less. This indicates that the full potential of globalization is not readily translated into poverty reduction in Bangladesh. In order to make the liberalization policies sufficiently pro-poor, the process needs complementary measures aiming at strengthening the institutional capabilities, addressing the structural bottlenecks, and improving the anti-poverty policy regimes in the country. In addition to ensuring the consistency of the macroeconomic policy regime with the globalization efforts, this would require that the process be made sensitive to the social costs and shaped by domestic policy regimes, be consistent with appropriately targeted social safety nets measures for the affected poor and guided by the institutional capacity to manage the transition process.

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Appendix I: Summary of the CGE Model Specification

	Equation	Description
	Price Block	
	$PM_i = PWM_i \cdot ER \cdot (1 + tm_i + tv_i)$	Import price
	$PM_i = PWE_i \cdot ER$	Export price
	$P_i \cdot Q_i = PD_i \cdot D_i + PM_i \cdot M_i$	Composite price
	$PX_i \cdot X_i = PD_i \cdot (1 - td_i - tv_i) \cdot D_i + PE_i \cdot E_i$	Activity price
	$PN_i = \sum_j \tau_{ji} \cdot P_j$	Input price
	$PV_i \cdot V_i = PX_i \cdot X_i - PN_i \cdot INT_i$	Value added price
	$PK_i = \sum_j \kappa_{ij} \cdot P_j$	Capital price
	$PINDEX = \frac{GDPVA}{RGDP}$	Numeraire price
	Production and Supply Block	
	$V_i = AV_i \cdot [\sum_f \alpha_{if} \cdot FD_{if}^{-\mu_i}]^{-\frac{1}{\mu_i}}$	Value added function
	$FD_{if} = V_i \cdot \left[\frac{\alpha_{if} \cdot PV_i}{AV_i^{\mu_i} \cdot W_f \cdot \varpi_{if}} \right]^{\frac{1}{1+\mu_i}}$	Factor demand
	$Q_i = AQ_i \cdot [\delta_i \cdot M_i^{-\rho_i} + (1-\delta_i) \cdot D_i^{-\rho_i}]^{-1/\rho_i}$	Composite supply (Armington Function)
	$M_i = D_i \cdot [\frac{PD_i \cdot \delta_i}{PM_i \cdot (1-\delta_i)}]^{\sigma_i}$	Import-domestic demand ratio
	$Q_i = M_i + D_i$	Composite commodity aggregation for perfect substitutes
	$Q_i = D_i$	Composite supply for non-imported commodities
	$Q_i = M_i$	Composite supply for non-produced imports
	$X_i = AT_i \cdot [\gamma_i \cdot E_i^{-\phi_i} + (1-\gamma_i) \cdot D_i^{-\phi_i}]^{1/\phi_i}$	Composite supply function
	$E_i = D_i \cdot [\frac{PE_i \cdot (1-\gamma_i)}{PD_i \cdot (1-td_i)}]^{\varphi_i}$	Export supply
	$E_i = E_i^0 \cdot \left[\frac{PWE_i}{PWSE_i} \right]^{\eta_i}$	Export demand
	Institutional Income	
	$Y_h = [YF_h + RM_h] \cdot (1 - th_h - s_h)$	Household income
	$YG = \sum_h th_h \cdot Y_h + \sum_i tm_i \cdot PWM_i \cdot M_i \cdot ER + \sum_i td_i \cdot X_i \cdot PD_i$	Government income
	$CD_{ih} \cdot P_i = \beta_{ih} \cdot Y_h$	Consumption demand

	Equation	Description
	$GD_i = \beta_i^g \cdot \overline{GTOT}$	Government demand
	$PK_i \cdot DK_i = \xi_i \cdot I$	Investment by destination
	$ID_i = \sum_j \kappa_{ij} \cdot DK_j$	Investment by origin
	$INT_i = \sum_j \tau_{ij} \cdot N_j$	Intermediate demand
	Equilibrium Condition	
	$S = \sum_h SH_h + SG + SF$	Total savings by institutions
	$Q_i = INT_i + \sum_h CD_{ih} + GD_i + ID_i$	Product market balance: supply equals demand
	$\sum_i PWM_i \cdot M_i - \sum_i PWE_i \cdot E_i - \sum_h \overline{RM_h} - SF = 0$	Current account balance: receipts equal to outlays
	$I = S = \sum_h SH_h + SG + SF$	Macro balance: investment equals savings
	$GDPVA = \sum_i PV_i \cdot V_i + INDTAX + TARIFF$	GDP value added
	$RGDP = \sum_i CD_i + ID_i + GD_i + E_i - (1 - \partial_i) * M_i$	Real GDP

Appendix 2: Bangladesh Social Accounting Matrix for 1995-96 (in Billion Taka)

Accounts		Activity								
		Aman	Boro	Grains	Commer	Livestock	Fish	Forestry	Rice Mill	Ata
Activity	Aman	9.81	0.00	0.00	0.00	3.62	0.00	0.00	87.50	0.00
	Boro	0.00	10.33	0.00	0.00	10.96	0.00	0.00	105.82	0.00
	Grains	0.00	0.00	1.24	0.00	1.53	0.00	0.00	0.00	12.54
	Commercial crop	0.00	0.00	0.00	17.18	3.03	0.00	0.00	0.00	0.00
	Livestock	11.70	10.68	1.53	5.45	1.65	0.25	0.00	0.00	0.00
	Fish	0.00	0.00	0.00	0.00	0.11	3.32	0.00	0.00	0.00
	Forestry	0.00	0.00	0.00	0.77	0.00	0.10	0.00	0.75	0.00
	Rice Mill	0.00	0.00	0.00	0.00	4.26	0.47	0.00	0.00	0.00
	Ata	0.00	0.00	0.00	0.00	3.47	0.13	0.00	0.00	0.00
	Other Food	0.00	0.00	0.00	0.09	5.11	0.42	0.00	0.00	0.00
	Leather	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cloth	0.00	0.01	0.00	0.00	0.11	0.27	0.00	1.40	0.12
	RMG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Tobacco	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Chemical	2.29	3.16	0.12	0.92	1.60	0.26	0.00	0.00	0.00
	Fertilizer	3.41	5.65	1.47	7.28	0.02	0.17	0.00	0.00	0.00
	POL	0.15	2.36	0.13	0.16	0.03	1.26	0.00	0.45	0.02
	Machinery	0.31	0.41	0.04	0.13	0.24	0.66	0.44	0.66	0.31
	Miscellaneous Industry	0.00	0.00	0.00	0.13	1.60	1.87	0.17	0.92	0.05
	Construction	0.15	0.25	0.02	0.02	0.00	0.00	0.01	4.39	0.18
	Utility	0.04	0.65	0.01	0.03	0.19	0.00	0.00	7.28	0.38
	Trade	12.69	24.71	1.71	26.47	9.74	32.68	38.86	18.41	2.26
	Social	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.00
	Public Administration	0.03	0.05	0.01	0.12	0.03	0.02	0.72	0.01	0.01
	Financial Ser	0.00	0.00	0.04	0.19	0.06	0.13	0.00	0.37	0.03
	Other Service	0.13	0.24	0.01	0.04	0.96	0.18	0.00	0.03	0.00
Factors	Male-Low Skill	24.29	25.34	2.44	13.32	16.08	0.66	8.35	1.46	0.17
	Male-Med Skill	5.45	5.68	0.55	2.99	3.61	0.88	1.46	0.84	0.10
	Male-High Skill	2.43	2.53	0.25	1.34	1.61	0.83	0.76	0.64	0.08
	Female-Low Skill	4.16	4.28	0.19	4.26	12.85	0.45	0.04	1.03	0.00
	Female-Med Skill	0.70	0.71	0.03	0.72	2.18	0.06	0.00	0.05	0.00
	Female-High Skill	0.15	0.16	0.01	0.16	0.46	0.04	0.00	0.04	0.00
	Capital	23.04	29.93	2.33	43.26	32.40	30.49	30.78	89.63	7.35
Households	Labourer									
	Small Farmers									
	Large Farmers									
	Non-Farm									
	W-Low Skilled									
	W-Skilled									
	Professional									
	Government	0.00	0.00	0.69	0.63	0.00	0.15	0.00	0.02	0.00
	Rest of the World	0.00	0.00	4.21	7.49	2.34	0.00	0.00	0.57	0.04
	Consolidated Capital									
	Total Supply	100.93	127.12	17.04	133.15	120.20	75.73	81.60	322.29	23.66

Accounts		Activity								
		Oth Food	Leather	Cloth	RMG	Tobacco	Chemical	Fertilizer	POL	Machinery
Activity	Aman	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Boro	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grains	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Commercial crop	25.45	0.01	20.26	0.05	3.46	0.02	0.00	0.00	0.00
	Livestock	0.41	12.97	0.00	0.00	0.00	1.00	0.00	0.00	0.00
	Fish	10.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Forestry	0.27	0.00	0.07	0.00	0.00	0.78	0.00	0.00	0.03
	Rice Mill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Ata	2.58	0.00	2.16	0.00	0.00	0.01	0.00	0.00	0.00
	Other Food	11.00	0.12	0.02	0.06	0.01	0.38	0.01	0.00	0.03
	Leather	0.00	1.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cloth	0.34	0.18	33.07	41.08	0.00	0.02	0.01	0.00	0.04
	RMG	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00
	Tobacco	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00
	Chemical	0.98	3.27	5.04	0.29	0.16	14.67	3.86	0.06	2.92
	Fertilizer	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	POL	0.99	0.03	0.29	0.11	0.01	0.12	0.03	3.10	0.31
	Machinery	4.58	0.65	3.80	1.37	0.40	2.22	2.67	3.72	38.32
	Miscellaneous Industry	1.92	0.13	0.90	1.47	1.82	2.79	0.23	0.05	1.22
	Construction	0.99	0.19	0.77	0.84	0.04	0.55	0.45	0.45	0.90
	Utility	1.14	0.39	3.53	0.36	0.04	0.56	1.60	0.15	3.25
	Trade	6.13	1.65	11.07	5.12	4.26	4.06	1.38	1.32	3.21
	Social	0.02	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.14
	Public Administration	0.25	0.09	0.19	0.05	0.01	0.20	0.04	0.12	0.25
	Financial Ser	1.78	0.79	1.61	0.34	0.04	0.65	1.36	4.04	2.35
	Other Service	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Factors	Male-Low Skill	1.95	0.91	14.17	2.23	1.02	1.56	0.62	0.92	2.50
	Male-Med Skill	1.17	0.46	7.15	0.86	0.59	1.05	0.40	0.22	2.01
	Male-High Skill	0.87	0.51	7.93	1.46	0.46	2.53	0.99	0.20	1.59
	Female-Low Skill	0.11	0.02	1.39	11.05	0.47	0.15	0.02	0.01	0.08
	Female-Med Skill	0.01	0.00	0.40	2.96	0.02	0.02	0.00	0.00	0.00
	Female-High Skill	0.00	0.00	0.13	2.06	0.02	0.45	0.07	0.00	0.00
	Capital	21.69	7.76	28.86	25.65	7.26	3.50	2.50	12.43	18.48
Households	Labourer									
	Small Farmers									
	Large Farmers									
	Non-Farm									
	W-Low Skilled									
	W-Skilled									
	Professional									
	Government	5.65	0.19	8.39	0.15	8.70	9.39	0.00	8.46	20.66
	Rest of the World	8.39	0.28	22.90	1.37	0.11	24.01	2.84	9.78	70.98
	Consolidated Capital									
	Total Supply	109.08	31.94	174.09	99.48	28.94	70.69	19.12	45.03	169.27

Accounts		Activity							
		Mis.Ind	Construction	Utility	Trade	Social	Pub Adm	Fin Ser	Other Serv
Activity	Aman	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Boro	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grains	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Commercial crop	0.03	0.49	0.00	0.00	0.03	0.00	0.40	3.57
	Livestock	0.02	0.00	0.00	0.00	0.13	0.00	0.00	5.76
	Fish	0.00	0.00	0.00	0.00	0.02	0.00	0.00	2.38
	Forestry	3.54	37.84	0.00	0.00	0.00	0.00	0.00	0.00
	Rice Mill	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.98
	Ata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.44
	Other Food	0.28	0.00	0.00	12.62	0.02	0.06	2.21	4.09
	Leather	0.01	0.00	0.00	0.06	0.00	0.00	0.00	0.00
	Cloth	0.29	0.06	0.01	1.84	0.28	0.16	0.44	1.10
	RMG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Tobacco	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.25
	Chemical	3.64	4.28	0.02	4.87	2.12	0.55	2.20	0.00
	Fertilizer	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	POL	1.39	1.26	2.09	20.74	0.54	0.65	0.31	0.00
	Machinery	2.59	30.76	0.85	9.34	0.92	0.87	0.82	2.17
	Miscellaneous Industry	14.66	29.02	0.17	16.73	1.38	2.71	6.48	1.00
	Construction	0.98	0.12	0.15	0.63	0.54	5.08	0.20	10.62
	Utility	5.22	6.58	3.51	4.92	0.91	0.61	1.39	1.26
	Trade	6.61	35.09	4.08	79.47	12.52	1.54	43.31	31.83
	Social	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00
	Public Administration	0.07	0.74	0.09	12.13	0.94	1.50	0.25	0.27
	Financial Ser	0.54	0.95	0.13	20.35	0.78	3.98	3.62	3.61
	Other Service	0.00	0.00	0.00	33.24	1.05	0.25	11.05	1.05
Factors	Male-Low Skill	6.68	17.46	1.24	152.32	1.42	2.95	2.70	27.21
	Male-Med Skill	3.00	3.74	0.98	62.24	2.72	5.12	2.28	12.25
	Male-High Skill	2.98	5.41	5.30	57.91	20.15	22.63	17.77	13.79
	Female-Low Skill	1.62	0.63	0.02	4.44	0.43	0.23	0.09	10.54
	Female-Med Skill	0.23	0.00	0.00	0.51	0.42	0.42	0.12	1.49
	Female-High Skill	0.03	0.00	0.41	0.46	5.99	2.26	1.12	1.13
	Capital	22.24	59.66	35.52	76.27	29.96	7.91	69.86	110.25
Households	Labourer								
	Small Farmers								
	Large Farmers								
	Non-Farm								
	W-Low Skilled								
	W-Skilled								
	Professional								
	Government	10.41	0.00	5.83	0.27	0.02	0.10	1.23	0.23
	Rest of the World	99.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Consolidated Capital								
	Total Supply	186.07	234.07	60.39	571.41	83.30	59.57	167.91	248.28

Accounts		Factors							Households	
		M-Low Sk	M-Med Sk	M-High Sk	F-Low Sk	F-Fed Sk	F-High Sk	Capital	Labourer	Small
Activity	Aman								0.00	0.00
	Boro								0.00	0.00
	Grains								0.13	0.29
	Commercial crop								4.26	10.06
	Livestock								2.47	5.70
	Fish								3.46	8.10
	Forestry								4.20	7.81
	Rice Mill								45.37	53.09
	Ata								1.74	2.51
	Other Food								3.52	10.09
	Leather								0.30	1.31
	Cloth								4.60	10.17
	RMG								0.35	0.85
	Tobacco								2.75	5.06
	Chemical								0.97	1.85
	Fertilizer								0.00	0.00
	POL								0.30	0.57
	Machinery								0.42	1.02
	Miscellaneous Industry								2.82	12.94
	Construction								0.00	0.00
	Utility								0.42	1.03
	Trade								2.51	9.24
	Social								1.10	3.65
	Public Administration								0.04	0.08
	Financial Ser								5.91	12.50
	Other Service								7.95	18.31
Factors	Male-Low Skill									
	Male-Med Skill									
	Male-High Skill									
	Female-Low Skill									
	Female-Med Skill									
	Female-High Skill									
	Capital									
Households	Labourer	74.90	7.06	1.24	12.24	0.51	0.23	0.00		
	Small Farmers	63.96	18.14	9.98	12.35	1.70	1.25	79.57		
	Large Farmers	28.67	17.78	14.70	6.36	1.95	1.34	146.00		
	Non-Farm	78.54	28.62	36.53	14.75	3.16	2.87	123.88		
	W-Low Skilled	80.66	10.30	5.62	9.39	0.95	0.67	66.16		
	W-Skilled	1.91	42.54	6.82	1.37	1.55	0.69	133.77		
	Professional	1.35	3.33	98.04	2.11	1.21	8.10	279.65		
	Government									
	Rest of the World									
	Consolidated Capital								0.59	12.25
	Total Supply	**329.98**	**127.79**	**172.94**	**58.58**	**11.03**	**15.13**	**829.03**	**96.18**	**188.51**

Accounts		Households					Other Institutions		Capital	
		Large	NFHH	W-Low Skilled	W-Med. killed	Professional	Government	Rest of World	Consolidated Capital	Total Demand
Activity	Aman	0.00	0.00	0.00	0.00	0.00	0.00	0.00		100.93
	Boro	0.00	0.00	0.00	0.00	0.00	0.00	0.00		127.12
	Grains	0.29	0.30	0.16	0.11	0.13	0.00	0.00		17.04
	Commercial crop	11.02	9.77	5.03	4.11	14.45	0.00	0.50		133.15
	Livestock	9.56	9.80	8.56	10.13	22.31	0.00	0.14		120.20
	Fish	8.56	10.34	5.67	4.85	7.06	0.00	11.78		75.73
	Forestry	6.53	9.91	4.71	2.51	1.78	0.00	0.00		81.60
	Rice Mill	28.28	89.40	47.97	28.67	23.77	0.00	0.01		322.29
	Ata	1.44	3.68	1.79	1.19	1.51	0.00	0.00		23.66
	Other Food	12.66	11.28	6.83	7.00	13.74	0.00	7.43		109.08
	Leather	1.78	1.91	1.16	1.70	5.54	0.00	16.84		31.94
	Cloth	11.49	14.55	9.19	8.60	16.05	0.00	18.59		174.09
	RMG	0.98	1.17	0.71	0.73	1.42	0.00	92.73		99.48
	Tobacco	4.40	6.33	3.59	3.01	3.44	0.00	0.00		28.94
	Chemical	1.90	2.96	2.12	1.52	1.76	0.00	0.30		70.69
	Fertilizer	0.00	0.00	0.00	0.00	0.00	0.00	1.11		19.12
	POL	0.48	1.13	1.78	1.67	2.07	0.00	0.49		45.03
	Machinery	1.64	2.05	1.38	1.22	1.51	0.00	0.75	50.02	169.27
	Miscellaneous Industry	24.86	14.51	8.17	7.94	16.74	0.00	1.74	8.93	186.07
	Construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	205.57	234.07
	Utility	0.92	1.79	2.65	3.19	6.39	0.00	0.00		60.39
	Trade	14.08	21.00	13.87	18.43	72.11	0.00	0.00		571.41
	Social	6.94	6.44	3.86	5.69	11.57	43.46	0.00		83.30
	Public Administration	0.10	0.13	0.09	0.10	0.24	40.58	0.00		59.57
	Financial Ser	16.08	19.76	13.38	14.85	37.68	0.00	0.00		167.91
	Other Service	24.63	30.57	26.27	24.51	67.81	0.00	0.00		248.28
Factors	Male-Low Skill									329.98
	Male-Med Skill									127.79
	Male-High Skill									172.94
	Female-Low Skill									58.58
	Female-Med Skill									11.03
	Female-High Skill									15.13
	Capital									829.03
Households	Labourer							0.00		96.18
	Small Farmers							1.56		188.51
	Large Farmers							2.76		219.56
	Non-Farm							7.50		295.85
	W-Low Skilled							3.38		177.13
	W-Skilled							21.57		210.22
	Professional							23.51		417.31
	Government		2.00		5.00	8.00				96.16
	Rest of the World									254.33
	Consolidated Capital	30.93	25.08	8.19	53.47	80.24	12.11	41.64		264.51
	Total Supply	219.56	295.85	177.13	210.22	417.31	96.16	254.33	264.508	7124.59